

Health and Supply Chain Domain Overlap

This document provides an overview of the Supply Chain and Health domain overlap. This was discussed on the [18 May 2018 Supply Chain Call](#). Both the Health and Supply Chain domains define metadata for locations, health workers and terminologies. At the high level, there appears to be great overlap, but when we get down to the details, the field level detail is different. This document focuses on identifying these differences to drive the discussion moving forward.

- [Definitions](#)
- [Independent Domains and Overlap](#)
 - [Health Workers](#)
 - [Geographic Hierarchy](#)
 - [Locations](#)
 - [Care Services Discovery](#)
 - [Antigen/Commodity/Product/Trade Item](#)
 - [Programmes](#)
 - [Population Estimates](#)
- [Transactions](#)
 - [Immunisation Event](#)
 - [Next Visit Planning](#)
 - [Stock Events and Stock Management](#)
 - [Master Data Management Transactions](#)
- [Reporting](#)
- [Differing Definition of "Wastage"](#)

Definitions

Commodity - A commodity is a good that can be consumed.

Dispense - This is an action that captures giving the commodity to the patient. In the case of immunisations, this is a shot in the arm, in the case of oral medications, this is the transaction that gives the medication to the patient to take at another time.

Wastage - See the section below titled Differing Definition of Wastage

Independent Domains and Overlap

This section provides the high level view of the domain overlap:

Health Domain	Overlap	Supply Chain Domain
<ul style="list-style-type: none">• Patient Demographic Information• Biometrics• Longitudinal Health Record (SHR)• Health Related Reporting	<ul style="list-style-type: none">• Health Workers• Locations• Geographic Hierarchies• Commodity Terminology• Cross-domain Programmes• Cross-domain Reporting• Schedules• Cross-domain dependencies	<ul style="list-style-type: none">• Supply Routes• Detailed Commodity Definitions• Supply Chain Related Reporting

Health Workers

Both the Health Domain and Supply Chain need to adequately represent health workers. OpenHIE follows the WHO definition of health workers which are "all people engaged in actions whose primary intent is to enhance health." ([Source](#)) This definition is critical to define the overlap because the health workforce includes both Health Service Providers and Health Management and Support Workers allowing us to define individuals in the supply chain as Health Workers. The following table provides some examples from each domain:

Health Workers in the Health domain	Health Workers in the Supply Chain domain
<ul style="list-style-type: none">• Professionals like doctors and nurses• Associates like laboratory technicians• Community Health Workers• Hospital Administrators	<ul style="list-style-type: none">• District Immunisation and Vaccine Officer (DIVO)• Cold Chain Technician• Vaccine Warehouse Manager• Logistician• Delivery Driver• EPI programme supervisor

Each of the Supply Chain domain personas aren't historically tracked in the OpenHIE Health Worker Registry, but they each play a role in the approval and delivery of commodities throughout the health system.

Action: Review the HWR profile and identify if the supply chain personas ([Sample Profile Source](#)) are appropriate to be tracked at the country level.

Geographic Hierarchy

Both the Health and Supply Chain domains represent the geographic hierarchy in multiple ways. Both systems recognize administrative levels of hierarchy including national, province, district, zone, village, etc. These hierarchies are used by both domains to identify locations. However, each domain identifies differing levels of geographic hierarchy with specific specialization and catchment areas. These geographic hierarchies often have associated point, line and polygon geospatial references that are used for planning and separation of duties at each level.

Geographic Hierarchy in the Health domain	Geographic Hierarchy in the Supply Chain domain
<ul style="list-style-type: none">• Tertiary Care - National Reference Hospital• Secondary Care - Regional Hospital• Primary Care - District Hospital• Health Centres, posts• Community Health Workers <p>(Source p72)</p>	<ul style="list-style-type: none">• Country - National Warehouse(s)• Region - Provincial Warehouses• District - District Warehouses• City - Hospitals• Health Posts <p>(Source OpenLMIS Demo Data)</p>

Each location within the particular domain sits within the administrative hierarchy and the respective domain specific hierarchy.

Action: Review mCSD specification to see if it can handle different hierarchy definitions for a particular domain

Locations

Locations are often digital representations of brick and mortar buildings in both domains. They can also represent lower level units like a department in a major hospital. Both domains require specific information about services and capabilities at each location. The CSD IHE profile and FHIR location standards capture the location succinctly and provide attributes to expand them where needed. More information on the CSD standard can be found in the subsequent section.

Care Services Discovery

The [CSD IHE profile](#) focuses on providing information on organisations, locations, practitioners and healthcare services throughout a health system. This standard was built to serve the needs of health domains and will need to be modified or translated to support additional Supply Chain metadata and information. Organisations and locations seem to be mapped well to both the Health and Supply Chain domains. However, the definition of a Practitioner in the CSD profile will need to be evaluated against the actors defined in the Health Workers section above, especially in relation to the healthcare services provided at a location.

The Healthcare services domain object within the CSD profile is specific to the Health domain and doesn't map well to the Supply Chain domain. The Supply Chain domain can consume these healthcare services to identify possible programmes and commodities needed at that location. However, the Supply Chain needs to have additional information such as Cold Chain Equipment (CCE) availability and status.

Action: Identify Supply Chain domain services that are tracked separately. (i.e. programmes, CCE, stock transaction reasons)

Antigen/Commodity/Product/Trade Item

This is the primary area where the domains differ. We have seen that the Health domain is less specific in the definition of a commodity than the Supply Chain domain. For example, immunization schedules focus on ensuring a child receives a specific antigen (BCG, Rota, Tetanus, etc.) and the immunizing nurse tracks whether that antigen was disbursed to the child. The Supply Chain domain is focused on much more information about the commodity that is disbursed to the child including the manufacturer information, lot, expiration date, doses per vial, package size, price, etc. This additional metadata is used throughout the supply chain to ensure that the commodity is available when needed and is included in a number of transactions throughout the supply chain. When a commodity is disbursed to a patient, the corresponding health transaction may or may not include dosing information on the prescription, but it must be available at the store when picked by the nurse or the patient. Below is an example of domain specific information required per domain:

Commodities in the Health domain	Commodities in the Supply Chain domain
<ul style="list-style-type: none">• Schedules focus on Antigen• Prescription focus on doses per time• (rare) Track lot number during disbursement	<ul style="list-style-type: none">• Trade Item (Manufacturer, lot, expiration, dose, package unit)• Cold Chain requirement• Commodity Type for ordering

Programmes

The EPI programme is common in many areas and spans both the Health and Supply Chain domains. A national scale common definition of a programme may support unified reporting across domains.

Action: Can we add value to the HIE by tracking programmes independently?

Population Estimates

Accurate population estimates by geographic catchment areas drive many decisions in both domains. Population estimates are generated by governments and supporting organizations in multiple ways and are assigned at varying levels of the geographic hierarchy. These population estimates commonly associate the number of people stratified by demographic information (age group, sex, etc.) and linked to a particular geographic area. The population estimates are often measured on a regular basis and projected annually.

Transactions

This section focuses on defining some of the transactions that have an impact on each domain.

Immunisation Event

The Immunisation event transaction requires that frontline health workers have the commodity they need at the time they need it and the patient has arrived on a particular schedule. The actual disbursement of the immunisation to the patient tracks the consumption of 1 dose within the health domain and that single dose is pulled from a vial of 1, 2, 10 or 20 available doses. From the supply chain perspective, the opening of the vial ends the point where the supply chain is involved because the commodity was appropriately delivered for its intended purpose (see differing definition of "wastage" section below).

Next Visit Planning

The Health domain for immunisation has a predefined schedule for each child. This schedule is set at the national level and each frontline health worker is responsible for providing the next visit information to the patient and caregiver when they complete a visit. Each child who receives care at a particular location has a schedule of visits for the first two years of life. This schedule can support the allocation of Health domain team members as well as inform the supply chain to increase the likelihood that the commodities are available when needed.

Stock Events and Stock Management

Location based Stock Management is a critical component of both domains. Each time a commodity is transacted (issued, received, adjusted), that updates a ledger for each commodity that is on hand at that location. Digitizing and centralizing the stock management process has the ability to improve the efficiency of supply chains in any geographic area. In the perfect case, strong stock management will allow supply chains to reduce the amount of safety stock required at multiple levels of the health system. Currently, it's projected that each level of the health system has a 25% safety stock on hand for each commodity needed on a regular basis. At the facility level, this means they keep 125% of their projected stock, the level above them at the district do the same and so on. At the national level, this results in a large amount of safety stock locked-in at multiple levels in paper based systems with minimal visibility available. Tracking stock event transactions at each facility, and making that information visible can make this more efficient.

Ultimately, linking the Stock Event and Next Visit Planning transactions in a central location has the ability to shift the supply chain from projection based planning to real-time responsive planning.

Master Data Management Transactions

There are a number of Master Data Management transactions that need to take place across the domains. These transactions focus on defining core master data that can be used across both domains.

Examples include:

- Introduction of new programmes to the health system
- Introduction or removal of commodities to the health system
- Addition or removal of location, organisation, providers (CSD related)
- Changes in administrative boundaries and geographic areas. (i.e. Nepal combines VDCs into districts on a regular schedule once populations achieve a threshold.)

Action: We need to clearly define these transactions.

Reporting

Cross domain reporting is one of the greatest areas of value. OpenHIE utilizes the Health Management Information System (HMIS) for aggregate reporting as a service. Each client system interacting with an HIE has a reporting to support their operational requirements. These systems often push aggregate reports to the HMIS. The combination of these domains has the ability to support a larger role of the HMIS from aggregate to operational reporting. Operational reporting supports real-time decisions on things like safety stock allocation, demand schedules, etc.

Action: Work on defining common aggregate reports and operational reports that could add value if tracked by the HIE.

Differing Definition of "Wastage"

The health and supply chain have a different definition of wastage when it comes to medical commodities:

Supply Chain Domain - The Supply Chain domain focuses on delivering a particular commodity to the point of service with the focus on ensuring that the commodity is available to be dispensed when the health worker needs it. As soon as the commodity is opened to be dispensed, the supply chain considers the commodity completely used for its intended purpose. Any wastage that takes place up to that point is considered "Wastage" by the supply chain. This is also referred to as "Closed Vial Wastage" in immunisation programmes. An example of closed vial wastage would be if a vial of BCG fell and broke before it was opened. Another example would be when vaccines become ineffective due to expiry dates or broken cold chains.

Health Domain - The health domain considers wastage at a level lower than the supply chain because they are primarily focused on ensuring the commodity is appropriately dispensed to the patient. The health domain tracks wastage if there are doses available that have not been dispensed to a patient. In the immunisation programme, this is commonly referred to as "Open Vial Wastage", which is an available dose of an immunisation that wasn't injected into a patient's arm. An example of open vial wastage is if a 20 dose vial of BCG is opened, but only 5 children showed up on a particular day. In this case, 15 doses of BCG would be wasted because they were available, but were not properly dispensed to a patient.